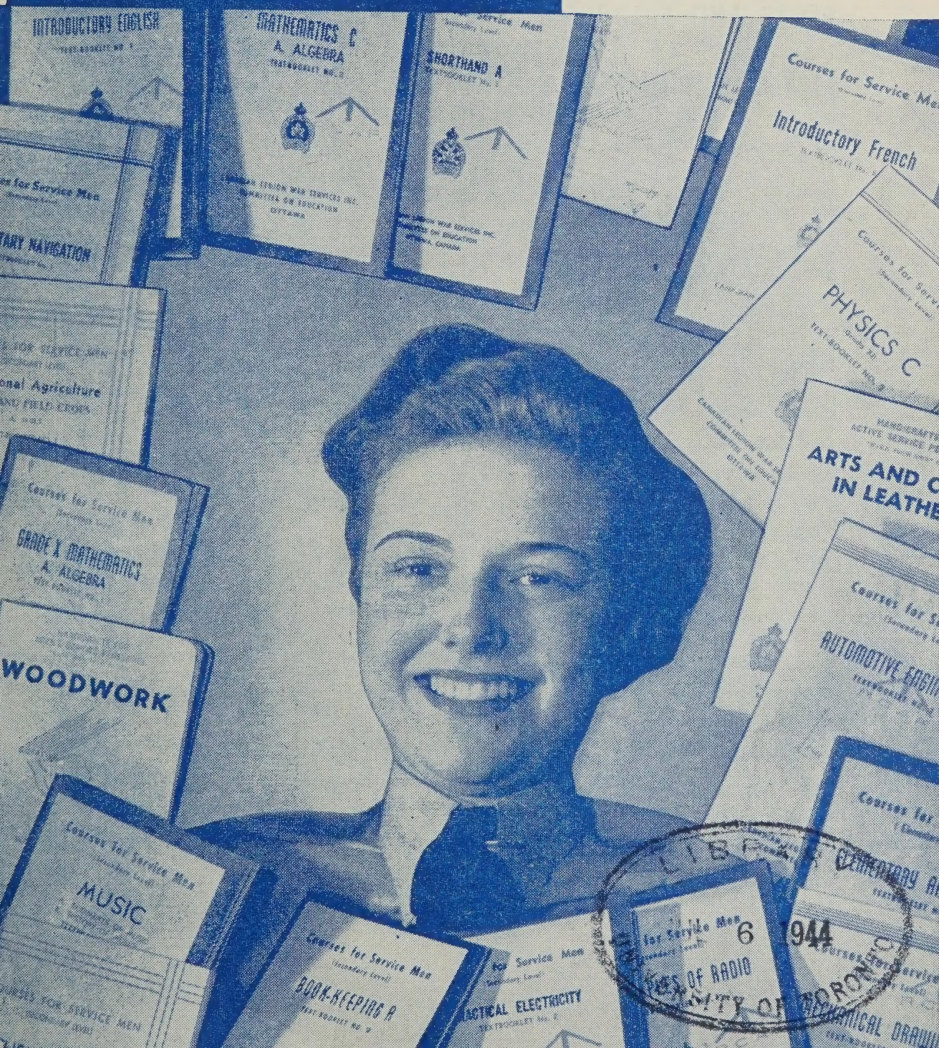


CANADA AT WAR

No. 37
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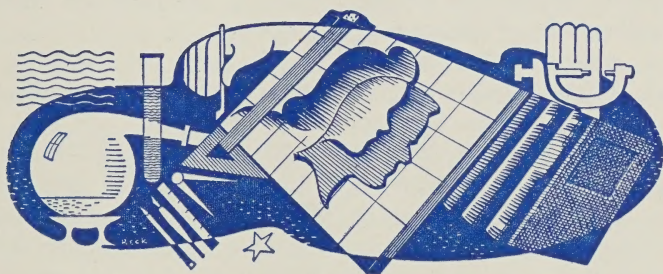
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The Cover: A member of the Royal Canadian Air Force (Women's Division) with some of the study courses offered by the Canadian Legion Educational Services for the armed forces.

CANADA AT WAR is a factual, monthly reference booklet of basic information on Canadian war activities. The material contained in it may be reproduced in whole or part, with or without credit to the Wartime Information Board.

Education in Armed Forces



FOR the first time in the history of Canada an educational program, identical in the nine provinces and extending beyond Canadian borders to Newfoundland, the United Kingdom and even into Italy and Germany, is in operation. Wherever Canadian men and women are serving in any of the armed forces or in the merchant navy, opportunities for study by correspondence at many of Cana-

da's schools and universities are extended to them. Classes were actually conducted during operations in Sicily and are being provided for at the present time in Italy.

Courses under this scheme have also been made available to members of the Royal Navy and of the air forces of the United Kingdom, Australia and New Zealand who are based in Canada, as well as to the Canadian

Fire Fighters, British prisoners of war and civilian internees.

Courses are voluntary, for the most part free, and serve three purposes. While none of them overlaps with compulsory service training, many courses are offered which may bring a man's or woman's education up to a standard that will fit him or her for training for a possible step-up in rank. For instance, the lack of prerequisite competence in English, mathematics or science may keep a potential flier on the ground. Fifty thousand courses given in these three subjects have enabled a steady flow of ground crew to remuster for air crew. The courses, however, were taken voluntarily and in the men's own time. Voluntary study of subjects of approximately junior matriculation level has enabled hundreds of seamen to qualify for higher rank. Similarly in the army, both men and women may qualify for trades pay or higher rank by bettering their education or studying a trade subject in their off-time.

A second use to which such courses are put is to prepare service personnel for better civilian jobs after discharge. Some fill in gaps in their high school or university education, while others

study trades or technical courses.

The third type of course is the recreational one. This includes subjects like handicrafts, painting and music.

In addition to correspondence courses, classroom courses are conducted wherever there is a sufficiently large group and facilities are obtainable. Other aids, such as libraries, information rooms, lectures and discussions are provided wherever possible.

Administration of Voluntary Learning

At the outbreak of war the Canadian Legion set up the Canadian Legion Educational Services (CLES) under the authority of the Department of National Defence and offered the three armed services assistance in providing courses. The navy had a directorate of education, the army established one in 1943, and the air force in 1942. A national committee on education of the Canadian Legion War Services was set up by the minister of national war services. It is composed of representatives of the Canadian Association of Adult Education, the Canadian and Newfoundland Educational Association, the

Department of Pensions and National Health, the directors of education of the three armed services and two representatives of the Canadian Legion. Regional sub-committees have been formed in 12 areas of Canada and in Newfoundland, with prominent local educationists as chairmen.

Every course or educational project for service personnel is originated by the education officers of the services themselves. If the project is of a non-service nature it is then discussed with the CLES regional committee on education, and the probable cost and equipment needs estimated. The proposal is then scrutinized by the National War Services Funds Advisory Board, and its recommendations are passed to the minister of national war services. This board, composed of civilian volunteers, was set up to supervise the budgets of other civilian volunteer groups (in this case, the Canadian Legion) which operate on grants from the Department of National War Services.

Once the proposal has been approved, the Legion grants funds, books, teachers or other facilities, and the educational

project is put in operation by the service interested.

Correspondence Courses

While each service conducts its own service program within its directorate of education, the CLES makes available to all a great number of courses. Those successfully completed will be credited throughout Canada and Newfoundland, and will be entered on the student's personal record in the branch of the service to which he or she belongs.

CLES courses are of four main types: Elementary school, high school (including academic, commercial, technical and vocational) university and special service courses. Sixty-seven text booklets have been prepared by the CLES; more than 227,800 of them have been distributed free. The total registration from the three services is 75,700, and 195,900 papers have been corrected; 2,380 students have already received certificates.

Ten Canadian universities have co-operated in supplying correspondence courses at greatly reduced rates. Fees vary from \$2 to \$10 for each course, and the student must buy his own books. A sufficient variety of

courses is included to provide a complete four-year program for the degree of bachelor of arts, with some choice of subjects in each year. Credits for work done are, broadly speaking, interchangeable among Canadian universities. For the year March, 1943, to February, 1944, 5,395 students enrolled in university courses—3,021 from the air force, 1,501 from the army, and 873 from the navy.

The most popular correspondence courses are those in English and mathematics.

Classroom Courses

Provided jointly by the CLES and the service concerned during the two years 1942 and 1943, 6,956 classes in a variety of subjects were given. The navy held 326 of these, with an attendance of 9,351; the army held 3,566, with an attendance of 77,025;

Mixed personnel class studies Japanese in a western school.



and the air force held 2,440 with an attendance of 63,932. The remaining 604 classes were "mixed" classes attended by members of more than one service and drew an attendance of 10,524.

Costs

Expenditures by the Department of National War Services through the CLES on voluntary education for the forces totalled \$1,267,022 in Canada and overseas \$637,677 from October, 1939, to December 31, 1943. The rapid increase in the use of this service is apparent when these figures are compared with the budget of \$1,162,000, for the current year, of which \$240,000 is earmarked for overseas. Approximately 10% of this is used for headquarters administration, including salaries, rentals, travel, furnishings and equipment. The remaining 90% goes to the actual provision of educational material and regional administration.

Navy

In addition to correspondence and classroom courses, each service is directing educational activities along various lines for its own personnel. The navy has had to adapt its methods of

teaching to ship's routine — which is exactly the same for ships ashore as for ships at sea, although in the case of the latter there may be frequent interruptions. In larger ships there is a schoolmaster (education officer) of the rank of sub-lieutenant or higher; in smaller ships a petty officer or leading hand may act as schoolmaster. Ashore or at sea, the sailor and Wren may carry on with their courses; and the most popular choices are those which fit the student for higher rates. Discussion groups on current affairs and post-war problems are encouraged; they are generally chaired by the schoolmaster.

An English-language school for French-speaking personnel is conducted at H.M.C.S. *Prevost* at London, Ontario. Since the first three-month course last summer, 120 French-Canadian sailors have learned English.

The navy has a remarkable library service, operated by a headquarters naval library committee. It maintains base libraries on each coast, presided over by Wren librarians. Bales of books are lent from these libraries to ships leaving port and replaced by different selections when the ships return.

Handicrafts are popular in ships, for crews have considerable periods off watch with little to do, unless an emergency arises.

A system of vocational guidance is now under discussion between the navy and the CLES, and the addition of job-direction to existing educational services may be expected shortly.

Army

Apart from regular courses of study, the army places great importance on its informational educative work. Information rooms are set up in every camp, and displays of pictures, maps, reading material, charts showing, for example, differences in actual enemy uniforms, model tanks, guns, planes and ships, and other forms of visual education are used. The progress of the war is kept up to date by the platoon officer who uses colored pins or ribbons to illustrate the day's positions. Material for new displays is kept flowing to him from the directorate of education.

Films are obtained by the film section of the army, and training, documentary and general interest films are kept circulating. During the month of March, 1944, there were 1,024 showings

of films, with an attendance of 139,000. Films from other sources, such as university departments of extension, are also used.

There are 299 unit libraries in Canada. Books have been donated by various private organizations, but the emphasis has been on English fiction. The army and the Canadian Legion Educational Services co-operate in providing non-fiction and French fiction for the libraries.

Discussion groups are encouraged, and great use is made of Army Bureau of Current Affairs bulletins, "Canadian Affairs," "Battle of Brains" and other informational booklets and papers. Discussions usually concentrate on a variation of the question, "What will happen to me after the war?" Rehabilitation provisions and the Marsh Report are popular subjects for discussion.

There are a great many handicraft groups among both men and women. Woodwork, weaving, folk-dancing, leatherwork, home-making and music are popular.

Army recruits at basic and advanced training centres are considered to be too busy to take on extra courses and are not



A French group from a Quebec regiment studies conversational English.

permitted to do so. As soon as they are posted to camps or overseas, however, they are free to enrol.

Special lectures have been arranged for the Veterans' Guard and for disposal companies. Those given the Veterans are usually courses which will provide a certain amount of knowledge of use to the man after discharge. For example, a company stationed close to a provincial department of agriculture or experimental farm may

have lectures on bee-keeping, poultry-raising, stock-judging, etc., together with visits to laboratories and farm.

The special lectures given to disposal companies—personnel at depots awaiting discharge—are limited by the shortage of time available and are usually in the form of information about jobs or vocations. They are designed to help the discharged soldier make his way back into civilian life. The men are advised, of course, to seek further

information and guidance from the Department of Pensions and National Health.

Air Force

The Royal Canadian Air Force has 300 education officers, of whom 80 are overseas in the United Kingdom, India, the Near and Middle East. A large part of the work of these officers is arranging for courses to enable men to remuster from ground crew to air crew or to qualify for trades. They also arrange for CLES correspondence courses and advancement classes.

Unit libraries have been built up so that they contain an estimated total of more than 200,000 books.

Special attention is being given to instruction, lectures and discussions in a Progress of War program. This program aims to provide background information on the history and progress of the war, to clarify its issues and aims, and to develop an ability to discuss war issues with tolerance and goodwill.

Progress of War lectures and discussions are conducted in training time at pre-air crew, initial training, elementary and service flying training, air gunner and navigation schools and

are mainly based on the text, "Battle of Brains," which has been authorized for the three armed services.

Voluntary lectures and discussions on current affairs have been held, but it has recently been decided to hold them, too, in working hours and to arrange that at least one hour a week be spent in a discussion program.

Film libraries have been established at all commands, and film circuits reach all units.

Information rooms provide source material, pictorial displays, maps and charts.

There is also a school of English for French-speaking personnel. The course runs 12 to 16 weeks and includes lectures on progress of the war and current events. More than 7,000 French-Canadian trainees have graduated from the school of English.

Tying in with the work of the directorate of education is the personnel counselling scheme worked out by the directorate of personnel selection and research. The scheme is to offer assessment, information and assistance to R.C.A.F. men and women and to enable them to train themselves, while still in the force, for the post-war job for which they are best fitted by

R.C.A.F.
sketch
club at
Gander,
New-
foundland
—about 40
members
enrolled.



personal aptitude, experience and background, learning acquired in the service, plus training acquired for that job in spare time. The program of counselling went into operation June 1.

Personnel counsellors (rank: Flight Lieutenant) have been trained at Rockcliffe Station for their work with the service personnel. Their training course teaches them scientific methods for assessing abilities and aptitudes, and counselling methods for listing information concerning interests, intentions and background. When an airman or member of the Women's Division has chosen the type of work for which he or she intends to qualify, the personnel counselor's work is done, and the work of the education officer begins,

for it is his job to arrange for the necessary supplementary training needed for the job.

Prisoners of War

The CLES has been made the only official Canadian agency for the dissemination of educational material to prisoners of war. It sends university courses, outlines and texts.

To the end of 1943, 334 of these courses had been sent. Prisoners do not pay for their university courses. More than 5,000 reference books have been sent by the CLES to libraries or individuals, in addition to more than 102,000 CLES text booklets. The CLES sends material to all allied prisoners, although organizations in other countries share the work.

Prisoners of War



CANADIAN prisoners of war, totalling 5,278 at May 31, 1944, are scattered through at least 47 German camps, one

Hungarian camp and at least 11 camps in the Far East.

Canadian prisoners were distributed as follows at May 31:

	Navy	Army	Air Force	Merchant Navy	Total
European Theatre:					
Germany	6	2,092	1,442	126	3,666
Location unknown ..	—	—	16	3	19
Neutral countries ...	—	1	14	—	15
	<u>6</u>	<u>2,093</u>	<u>1,472</u>	<u>*129</u>	<u>3,700</u>
Far Eastern Theatre:					
Japan	—	988	3	1	992
Sundry	2	—	16	12	30
Location unknown ..	—	—	5	3	8
Hong Kong (so far as known)	—	548	—	—	548
	<u>2</u>	<u>1,536</u>	<u>24</u>	<u>16</u>	<u>1,578</u>
Grand Total....	8	3,629	1,496	*145	5,278

**One reported dead. Living total 144.*

In the Pacific area camps are in Japan, Singapore, Formosa, Borneo, Java, Shikoku Island, Hong Kong and other unknown areas. In addition to prisoners of war in enemy hands, there is a certain number of members of the Canadian armed services in-

terned in the neutral countries of Switzerland, Sweden and Eire.

To June 8, 1944, 123 Canadian prisoners of war had been repatriated, two army nursing sisters from the Far East, and 121 other personnel from the European theatre as follows:

	Navy	Army	Air Force	Merchant Navy	Total
To Canada:					
Officers.....	—	7	4	5	16
Other ranks.....	1	76	7	7	91
					<hr/> 107
To United Kingdom:					
Officers.....	—	2	2	—	4
Other ranks.....	—	7	3	—	10
					<hr/> 14
TOTALS:					
Officers.....	—	9	6	5	20
Other ranks.....	1	83	10	7	101
	<hr/> 1	<hr/> 92	<hr/> 16	<hr/> 12	<hr/> 121

Although Japan was a signatory to the convention relative to the treatment of prisoners of war concluded at Geneva, Switzerland, on July 27, 1929, the convention was not ratified by the Japanese government. However, at the commencement of hostilities the Japanese signified their intention of abiding by the provisions of the convention. This they have failed to do in many important respects, and very little detailed information is available concerning the men in Japanese-held camps.

German Prison Camps

German-held prisoners are taken to "dulags" or transit camps after capture, where they are sorted out as to service and rank. Army officers go to an "oflag"; other ranks of the army go to a "stalag." Air men go to a "luft." There is also a camp for naval men and merchant seamen, called "marlag und milag." One oflag has been set apart by Germany for officers who have been recaptured after attempts to escape. An all-Canadian camp has recently been estab-

lished, at which more than 1,600 Canadians are reported.

Attached to the stalags are the work camps or "kommandos." These work camps may be anywhere within 100 miles of the main stalag, and there are sometimes as many as 480 kommandos attached to one stalag.

Each stalag has a "revier" or infirmary, and most of them have a "lazaret" or hospital. Stalag 9C, one of the largest, has five different lazarets attached to it. Certain specialized lazarets for prisoners have been reported, including one for orthopaedic cases, one for tuberculosis cases and one for men with eye injuries. Mental patients are treated in civilian hospitals.

At each camp the prisoners appoint one of their own number to act as their representative. British and Canadian prisoners call these representatives their "men of confidence." Such a man must be approved by the camp authorities, and he is then permitted to receive and speak freely with official visitors from the protecting power (Switzerland) or the International Red Cross committee; to write them freely; to lodge complaints; to receive and distribute collective

consignments of parcels, books, food, etc.; to organize among the prisoners a system of mutual aid; and to act as intermediary between the prisoners and the camp authorities.

Work Done by Prisoners

Canadian prisoners, other than officers, work in stone quarries, on river work, brick laying, electrical work, lumbering, agriculture, tailoring and at jobs in saw mills, paper factories, sugar factories, coal mines and beet factories. Their hours of work are usually long, nine or 10 hours, and the usual pay is 70 pfennigs a day, approximately the equivalent of 20 cents. They may not be used in any work directly connected with the prosecution of the war, such as the manufacture or transport of arms or munitions.

Supplementary clothing and food and recreational and educational material are sent the Canadians from home through various agencies. The first parcel a prisoner receives is a Red Cross "capture parcel," packed in Canada and stocked in London. It includes clothing and personal items. Other clothing parcels are sent from the Red Cross in the United Kingdom in

addition to the quarterly parcels which are sent most prisoners by their next-of-kin.

The Canadian Red Cross sends one food parcel per week per man. Each parcel weighs 11 pounds and is standardized to contain adequate nutritive values to supplement the German food ration.

Educational Facilities

Officer prisoners and merchant seamen cannot be required to work under the conditions of the Geneva convention and have more time for their own pursuits. Hundreds of officers and men have used the educational material sent over by the Canadian Legion Educational Services. Through the Legion's agency they may take elementary and secondary school courses and also university subjects and technical, agricultural and vocational training. Every camp boasts experts in various subjects among the prisoners who become the "faculty" of actual classroom lessons, in which texts sent by the Legion are used. Examinations are marked at the University of London under an agreement by which Canadian schools and universities accept the marks given. Some of the men take

courses that will qualify them to try for higher rank, and sailors and merchant seamen are using three classrooms in their camp preparing men for examinations for second mates, mates and masters.

Sports equipment, games and reading matter are sent largely through the agency of the International Young Men's Christian Association. Private citizens may also send parcels of recreational material to prisoners, but in order to facilitate censorship they must be sent directly by the store where they are bought.

Many of the prisoners take up handicrafts and sometimes hold an exhibition of their work. Camp choirs, orchestras, dramatic groups and even puppet shows are popular, as are discussion groups and debates.

Mail

Mail is the closest tie with home, and the prisoners eagerly await mail distribution. Non-commissioned officers and men are permitted to send out two letters and four postcards a month. Protected personnel—doctors, dentists, medical orderlies, chaplains, stretcher bearers—may send out four letters and eight postcards each month, and offi-

cers may send mail in amounts varying according to their rank. For the month of February, 1944, more than 49,000 pieces of mail were exchanged between Canadian prisoners of war and their relatives and friends.

Protected personnel are not to be regarded as prisoners of war and are entitled to be repatriated. However, Canada and Germany have agreed that, in view of the great service they render to the prisoners, each side may retain 10 protected personnel for every 1,000 prisoners of war. The 10 consist of two doctors, one dentist, one chaplain and six medical orderlies.

Official Canadian Organization

In Canada, eight separate departments of the Canadian government are actively engaged in looking after the interests and welfare of Canadian prisoners.

The Department of External Affairs is the official channel of communication between Canada and the enemy. It receives information concerning prisoners from the International Red Cross or from the protecting power, who have direct contact with the enemy's official bureau of information. Official visitors from

the protecting power, the International Red Cross and the International Y.M.C.A. are permitted to visit the German camps periodically, talk freely with the men of confidence and report their findings to the Department of External Affairs in Ottawa.

The three Departments of National Defence (for Navy, Army and Air) and the Department of Transport (for merchant seamen) send official notifications to next-of-kin. The three defence departments arrange for pay, dependents' allowances, etc., for the prisoners, and the merchant seamen's interests are cared for by the Department of Pensions and National Health, which also is responsible for the rehabilitation of repatriates and for handling disability pensions.

Voluntary Organizations

The Department of National War Services acts as co-ordinating body for all voluntary organizations rendering services to prisoners of war, and through its directorate of censorship is responsible for the censoring of all mail to Canadian prisoners. The Post Office Department handles regulations covering the sending of mail and parcels, all of which are transported free.

Several private organizations have direct contact with prisoners of war. These include the Canadian Red Cross, which ships food parcels, assists with next-of-kin parcels and operates an

enquiry bureau; the Canadian Legion Educational Services, which sends educational material; the Y.M.C.A.; the Canadian Prisoners of War Relatives' Association and other organizations.

CASH GOES TO WAR

FIRST WAR LOAN - 1940
\$200,000,000



SECOND WAR LOAN - 1940
\$300,000,000



1st VICTORY LOAN - 1941
\$730,376,250



2nd VICTORY LOAN - 1942
\$843,127,900



3rd VICTORY LOAN - 1942
\$991,389,050



4th VICTORY LOAN - 1943
\$1,308,716,650



5th VICTORY LOAN - 1943
* \$1,374,988,500



6th VICTORY LOAN - 1944
* \$1,388,524,900



* FINAL RETURNS NOT YET COMPLETED
EACH SYMBOL = \$200,000,000

Research in War Medicine



ONE of the ironic paradoxes of war is that while one group of men becomes specialists in killing, another makes great strides in the art of healing. Where bugles blow and guns roar, the men and women of medicine follow, and out of the shambles of the battlefield arises a newer and brighter hope for medical science.

War medicine begins when the raw recruit first walks through the recruiting office door. There follows the greatest possible stock-taking of national resources which only war has been

able to bring about so far. Standards of fitness for the armed forces "medical categories" are measurements of ability to do specific jobs under conditions of active service.

Once the recruit is in the forces he gets the most meticulous care. He becomes accustomed to competent medical attention; this is one of the reasons why war medicine will carry a beneficent imprint into the post-war future. The man in uniform develops a health consciousness he will wish to maintain for himself and his family when he re-

turns to civilian life. If the uniformed forces become used to the assurance of their own health, the population as a whole may adopt a similar consciousness.

The armed forces prove the ideal field to demonstrate and emphasize the benefits of preventive medicine. The value of inoculations, vaccinations and other methods of disease control become self-evident. War also proves to be a stimulus in the field of general medicine. Out of each great war emerges one or two outstanding therapeutic measures. In this war the sulpha drugs are finding a large and important use, and more recently penicillin therapy has opened great and unpredictable vistas for healing. From World War I came the development of the art of blood transfusion which has saved thousands of lives.

War medicine provokes a practical type of research. The scientist has always been interested in purely academic problems, but he is even more interested in a practical application of his laboratory findings. These efforts have brought an accuracy to the work in the armed forces which formerly was not possible.

Much of the remarkable research done in Canada during

this war cannot be revealed for security reasons, but a survey of a few of the projects gives some indication of its immense scope and practical nature. This experimental work is being carried on by the medical research staffs of the three services under the co-ordination and administration of the National Research Council.

Among the studies by the army medical research branch are those outlined in the following pages.

Nutrition

After the Battle of Malta it was found that dehydrated foods were not adequate to maintain optimum manpower efficiency. Food with a high vitamin C content which would most nearly approach fresh vegetables was aimed at. Recent studies showed that dry seeds in general are devoid of vitamin C, but when soaked and kept moist until the seeds begin to sprout, the seedlings contain a considerable amount of this vitamin. This is also true of certain of the components of vitamin B complex.

As a result much research has been done on sprouting seeds in large quantities and using the sprouts in palatable and attrac-

tive ways as the Chinese have done for centuries.

This study was to determine the vitamin C potency of sprouted seeds in a wide range of common crops, especially those which would be available on a large scale, and to recommend varieties and methods suitable for production of vitamin C under practical conditions for Canadian soldiers at home and abroad and for populations of countries released from enemy occupation.

It was found that field pea varieties were the best because they combine a reasonably high vitamin C potency with availability of seeds in large quantities. The English broad Windsor bean is placed second, and the Chinese salad bean third. The dry seeds are soaked for about 24 hours, then spread one to two inches deep in shallow trays with screen bottoms for drainage. They are sprinkled and drained and kept at a temperature of between 60 and 70 degrees. Sprouts will be ready for use in about three to five days, depending on variety—roughly when sprouts are about one inch long. Seed should have a very high germination percentage, since only germinating seeds produce vitamin C.

Further research was conducted to develop suitable methods of preparing sprouted seeds and legumes to supply balanced nutritional supplements. Dietetic studies were developed which included the testing of each type of sprout in the preparation of hot and cold dishes. To evaluate the nutritive value, analyses were made for vitamin C before and after cooking.

Nutritional Survey

The primary purpose of the nutritional survey was to observe the effects of Canadian Army rations and training on men newly inducted for compulsory military service. Complete pre-enrolment histories were taken, and special physical examinations made to arrive at their nutritional status. The dietary intake was assessed from a study of the socio-economic background and the dietary history. This included details of the eating habits of the men, methods of cooking employed in the home, individual food likes and dislikes, the approximate amount of various food taken per week and assessment of the "dietary intake of a typical day." It was found that the main pre-enrolment dietary inadequacies had

been in the intake of calories and vitamins C, B, and A.

Two months after induction a second complete check-up was made of the same men who were then at four or five different camps. The results showed a decided gain in physical fitness and morale—especially in those camps where messing was good and food was prepared attractively.

The research resulted in several recommendations. One such was the suggestion that provision be made for further education in nutrition to acquaint the general population with the most recent advances in nutrition and in the choice of nutritious foods and their correct cooking. Another recommendation proposed the standardization of messing and catering in the Canadian Army and that personnel supervising nutrition be adequately trained at recognized universities. Further proposals included the training of all ranks in the Canadian Army in the importance of proper nutrition and the raising of the status of cooks in the army.

Hydroponic Growth Methods

The value of fresh fruits and vegetables as opposed to syn-

thetic vitamins cannot be overstressed in maintaining the health of troops. Apparently fresh fruits and vegetables contain balanced nutrients and also specific factors essential to health which have not yet been isolated.

In North America Canadian troops are generally issued fresh fruits and vegetables, but in certain areas because of transportation difficulties or because of soil or climatic drawbacks they are difficult to supply. Among such isolated garrisons are those of the army and air force in Labrador, Newfoundland and other northern areas.

In these areas, especially Labrador, there is no true soil, and the top layer of sand is very acid. Grass, vegetables and fruits cannot be grown in quantity here, and this condition is responsible for the high incidence of nutritional diseases among the white civilian inhabitants. Supplies of vegetables for the troops in Labrador have to be taken in either by convoy with extremely high spoilage or flown in by air which is expensive.

It was decided that an attempt should be made to supply fresh fruits and vegetables to the men by growing them by the hydroponic method of chemical agri-

culture. Accordingly experiments were conducted at Goose Bay in Labrador to produce growth in sand and gravel by irrigation and chemical fertilization in artificial beds. The project, while still largely experimental, demonstrated the feasibility of hydroponic vegetable production on a fairly large scale in northern areas devoid of productive soil. On account of closer planting, yields can be

obtained equal to or even greater than those obtained in normal field production. Although installation costs are high, production is thought to be economically sound when the cost and percentage spoilage of such imported produce is considered.

Respiratory Tract Infections

Much research has been devoted to cutting down respiratory tract infections—the com-

Experts examine vegetables grown in hydroponic beds at Goose Bay, Labrador.



mon cold, influenza, pneumonia, tuberculosis, etc.—by which many man-hours and training hours are lost.

Respiratory tract disease casualties in Canadian military hospitals in Canada alone have been averaging 35,000 a year at an approximate cost to the taxpayer of \$6,000,000 annually. The loss to the army in 1942 alone amounted to 500,000 man-days, enough to fight the entire Canadian part of the Sicilian campaign—with 200,000 man-days left over.

Dust control as a means of combatting respiratory diseases was first tried on a major scale at Camp Borden last winter. It proved so effective in immobilizing the germs of all air-borne diseases that respiratory disease casualties dropped 50 to 65%.

Education of the soldier in personal hygiene and improved hygienic conditions of camps have also been stressed with the result that it is hoped to keep between 10,000 and 12,000 soldiers a year out of the hospital and save 140,000 to 170,000 training and fighting days.

Tump Line Carriage

Considerable study and experiment are being applied to

the “tump line” principle in evacuation of wounded and in the carriage of equipment which must be man-borne. The use of the tump line has been well known to trappers and voyageurs for hundreds of years. It consists of a simple strap, broadened in front to fit on the top of the head of the wearer and bearing long ends which are attached to whatever is to be carried. By this method it is possible to carry a greater weight than can ordinarily be carried with less fatigue and for greater distances.

During World War I the tump line had some use, and in this war the Russians using other simple methods have reported success in the evacuation of wounded by one man or one woman. This resulted in quicker rescue of casualties and less exposure of able-bodied stretcher bearers.

A stretcher evolved by Canadian research for use with the tump line is rigid, light and constructed with a toboggan-like bottom for sliding over the snow. A canvas top supports the casualty and straps him in place. It has handles for two or four-man carriage when necessary, but a tump line is provided for its normal carriage by one man.



One form of stretcher being carried by the tump line method.

Evacuation of wounded by the standard two and four-man stretcher bearer methods is often difficult and wasteful of manpower.

The tump line may also be attached to a loaded packboard for the bearing of heavy machine guns, mortars, etc.

When bearers are properly trained in this method and their neck muscles become hardened, it proves practical, quick and less fatiguing. Training of tump

line squads is easily accomplished. It is a relatively cheap method of transportation, and the equipment necessary is light and portable.

In the field, on the march and especially in amphibious operations, many items at times have to be carried by men. In the past this has been done in an

inefficient manner by carrying loads on the shoulder or under the arms. At present the packboard is being increasingly used, and with the tump line this method would be superior. It has an additional advantage in leaving the arms free for use in gunfire if necessary. It is recommended that the tump line become a recognized army procedure as it gives a striking contribution to the mobility of the soldier and to methods of

evacuation of the wounded. It is especially useful in jungle portage where trails are narrow and corners sharp or in any place where the terrain is rough. Recent demonstrations before the Canadian Medical Association in Toronto revealed the remarkable efficiency of this method.

Effort Syndrome

In the pre-enlistment medical tests and classification of recruits by the Pulhems system, every effort is made to predetermine physical and emotional weaknesses which might show up later under the rigors of active army life. However, there are many men who pass the initial physical

examinations only to fall down later when confronted with hard physical exertion. Much research is taking place in an endeavour to diagnose these signs and symptoms before the recruit is accepted into service. The symptoms are grouped medically as "Effort Syndrome."

Of the large numbers taken into the forces, many are confronted with a tremendous increase in physical exertion and often much greater nervous strain than in civilian life. After World War I the British Army pensioned 44,000 for conditions resulting from such circumstances. Greater knowledge may help to avoid such large numbers of disabilities and pensions.

Bicycle
apparatus
for
measuring work
output and
fatigue in
studying effort
syndrome.



The first problem that arises in connection with Effort Syndrome concerns the nature of the syndrome and how a case may be recognized and diagnosed. It is not a disease entity, but rather a group of symptoms commonly seen associated in a single case. In this work it is assumed that these symptoms develop when the emotional and physical stress to which a man is exposed exceeds his ability to withstand stress.

A study of such cases has broken them down into five groups. In the first group fall those men who have a definite organic disease. Such men can develop the symptoms of Effort Syndrome. When the disease is recognized the symptoms are then usually considered to be due to the disease and are no longer called E.S.

The second group involves constitutionally inferior individuals who usually give a past history of some of the symptoms of E.S. They show an inability to run or perform sports during their entire lives. The symptoms are usually aggravated by military service. Their inferiority may be either physical or mental or both.

In a third category are the training failures—men who appear normal before enlistment but who break down and develop symptoms of E.S. during military training. This usually becomes a vicious circle in which the physical shortcomings cause anxiety which in turn makes the physical performance poorer. Such cases are easier to prevent by intelligent training programs than to cure after the syndrome is well established.

Another group in which it is easier to prevent the syndrome than to treat it is the men who are convalescing after an operation or an illness and who show signs of E.S. because they attempt physical effort before they have entirely recuperated.

In the last group fall the psychoneurotics—men who have always been neurotic or men who have been previously healthy soldiers but who have developed an anxiety state or some form of psychoneurosis. In these cases there is often a decreased ability for exertion. This study is still in the experimental stage, but it is very important from the curative angle and also in the matter of recruiting and in casualty retraining.

There are certain recruits who

come up to present standards on passing through induction centres and yet who break down with the symptoms of E.S. when sent to basic training. It is thought possible that such men might be recognized at the reception centres and not be taken into the army. This would result in a considerable saving of trouble and expense.

During a routine examination of men called up under the National Resources Mobilization Act certain ones are picked who, while passing all existing standards for physical fitness and emotional stability, appear to have certain typical signs of E.S. These men are usually small, with a history of never having indulged in sports or hard physical exercise, and have cold, sweaty extremities and certain heart palpitations. Many are rejected by the psychiatrists for emotional instability and do not come under this present survey. Those who are put into the Canadian Army, together with a random selection of normal recruits, are taken to Longueuil Military Hospital in Quebec for about 48 hours of investigation. The intention is that these men are to be re-examined just before

the end of basic training to observe any changes.

If they prove unable to complete their basic training it is felt they should be taken back to the hospital for investigation prior to discharge. The purposes of such a study are two-fold. First, men who are unable to stand up to their military training will be expected to come from this picked group. Studies before and after such a breakdown may prove valuable in understanding the mechanism of the breakdown. Secondly, such studies may make it possible to avoid enlisting certain men who would be unable to undergo the training.

The whole question of E.S. has great possibilities for future elimination of wasted manpower, time, and money; as well as for therapeutic findings by which cures may be effected by early diagnoses.

Night Vision

As many combined operations take place at night a program of night vision training and testing was instituted. This was to discriminate between the soldier who can see at night and the one who cannot see well, and to train personnel in certain visual habits

to improve their night vision. As a result jobs could be allocated to better advantage. Because most modern life after sundown is illuminated artificially, the art of seeing in the dark is almost a lost one in the human race; yet many important posts in war must depend on the human eye—the scout, the man on the lookout, the tank operator, the truck driver, the aviator.

During the preliminary work carried out with R.C.A.F. research workers it became apparent that some form of training was necessary prior to testing if the men were to give their true performance in the test. A 45-minute demonstration period was eventually decided on as being the time necessary for the eye to “dark adapt” itself. During this period lectures and experimental training are given. The men are trained in groups of 16 and 20 in complete darkness and are shown a dimly lighted silhouette on a screen—possibly a landscape of hills, valleys, trees or military equipment which can be seen little by little as their eyes become adapted. Many interesting facts have been learned at this stage.

The first vision comes in a waxing and waning effect; a stationary object appears to be moving; imaginary points of light seem to flash like tiny airplanes.

Then trainees cover one eye, and the uncovered one is exposed to a bright light for a period. When both eyes are exposed to the darkened screen only the one which had been covered can see. This becomes an important fact in army night procedure—if sudden exposure to light is necessary, one eye can be kept closed to preserve its use in the subsequent darkness. Red light does not diminish ability to see in the dark as does white light. Trainees are taught to look *around* the object, not at it, as the image will then fall on that part of the retina which is most sensitive to dim light.

After the demonstration period the men retire to waiting-rooms and are then retested individually during the next hour. They are tested on a special night vision tester, and it is on the results of this test that an attempt is made to allocate them to certain jobs.

These tests provide the essential visual conditions encountered by soldiers in the field. The task of locating an object rather

than recognizing its form is chosen when it is found impossible to include both tasks in a short and simple test. It is probably of first importance for a soldier to recognize the presence of an object rather than to be able at once to distinguish its form.

A permanent Canadian Army night vision training and testing unit can handle 16 to 20 men an hour. Double units can be built to double the output. The ordinary single unit is staffed with three persons, and members of the Canadian Women's Army Corps have been found suitable for this work. They alternate hourly in giving demonstrations and operating the testing machines so that undue fatigue may be avoided.

Staff personnel receive their training in a comprehensive two-weeks' course during which the essentials of the anatomy and physiology of the eye are taught and the optics and mechanics of the training and testing boxes. All are required to give demonstrations repeatedly until they have either mastered the technique and can give a pleasing and convincing performance or have failed.

To serve small outlying centres, mobile night vision teams have been formed. These are equipped with especially made black-out tents of light-proof material which can be suspended or slung up in an army hut or room. The tents are divided into demonstration, waiting and testing rooms and are built to handle 10 men an hour. A new model, however, will have two testing rooms and be capable of handling 16 men hourly. The team, with its portable dark room, moves about in a truck to test remote garrisons.

Air Evacuation of Sick and Wounded

The question of air evacuation of the sick and wounded is undergoing considerable research both by the army and air force medical research branches. Considering the casualties which forthcoming active operations will produce, the subject is becoming increasingly important. The interest to the army lies in the fact that it will be army personnel who will be evacuated and army medical personnel who will be responsible for the care of the patients before and after evacuation. Army medical research officers are studying how various

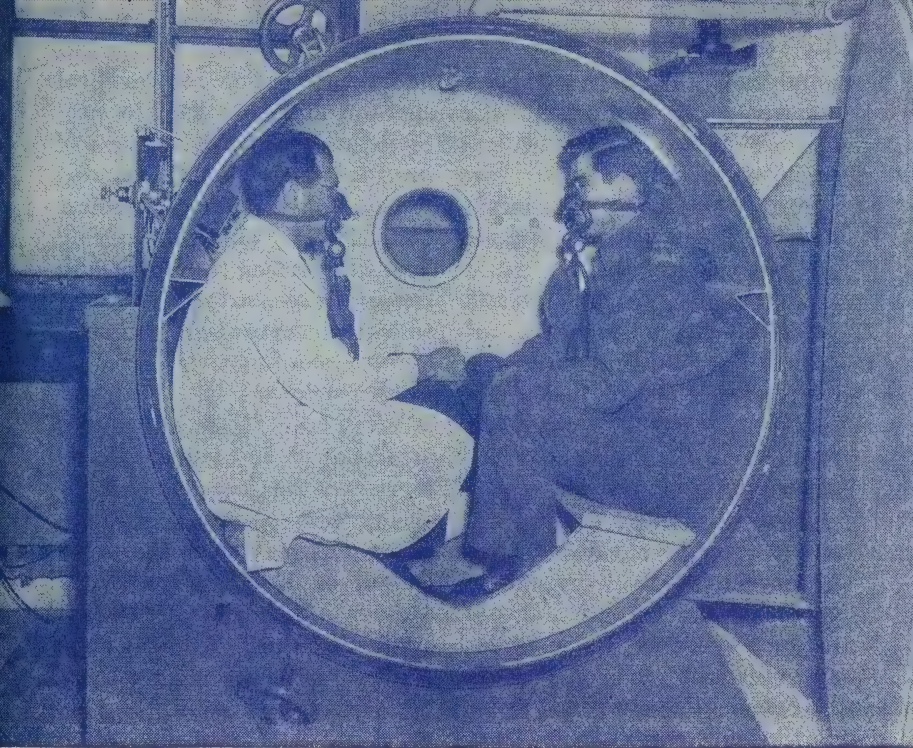
types of wounds react to high altitude so as to have some background knowledge about the kind of patients who should be evacuated by this method. The air force is directly concerned because air force planes will be used and air force medical personnel will be responsible for final selection and medical care during flights.

The first serious efforts of air evacuation in war were made by the Germans when the Condor Squadron flew casualties out of Spain during the Spanish Civil War. Many cases were taken back to Germany over the Alps at considerable altitudes, and it was demonstrated that this type of evacuation held little hazard for the sick and wounded. In the North African fighting, both United States and United Kingdom forces successfully employed returning transport planes to take wounded back to stations where they could be given necessary definitive treatment.

The aero-medical transport has a two-way shuttle importance. First comes the transport of the sick and wounded *from* battle areas to rear casualty clearing stations and later from these stations to well-

equipped hospitals in the interior. Secondly is the transport *to* active theatres of medical supplies, equipment and personnel.

Some outstanding problems confronting medical research in this virtually new field include the determining of effects of air transport on various types of wounds and injuries and the effects of drugs at high altitudes. Wounded patients who have been flown from eastern Canada to the Neurological Institute in Montreal have been closely studied for adverse effects. Many experiments have been conducted in decompression or "altitude" chambers, and the findings of the United States Army Air Force in the African, Alaskan and Pacific theatres have also led to many definitive conclusions. In general all types of sick and wounded seemed to withstand transport by air well, with the exception of those with abdominal wounds where intestinal penetration had occurred, although even in these cases the results were better than in surface ambulances. In the African area most flights were extremely low—usually at 100 to 200 feet and rarely exceed-



View of small decompression chamber before sealing for "ascent". This is used in studying effects of high altitudes on war wounds.

ing 2,000 feet. This virtually eliminated ill effects from oxygen shortage.

Patients suffering from head, chest or face injuries and severe burns were found to be especially recommended for air evacuation. A minimum of time lost in treatment speeds the chances for recovery in well-equipped and specialized centres. All patients support air transport

much better before than after a major surgical procedure. If immediate surgery is required, as in the case of amputation or abdominal and chest injuries, several days should elapse before air evacuation is attempted. All cases of hemorrhage or shock should also be treated by transfusion or some other method before flight.

Results in the Alaskan theatre

were much the same, although intense cold resulted in the freezing of blood and medical supplies. To counteract this, improved methods of heating supplies, food and chemicals are being developed.

In the Pacific and Asiatic areas findings were similar, although Pacific flights were quite high—from 8,000 to 10,000 feet—and the need for oxygen has resulted in improved oxygen-generating equipment.

Thus it is agreed by surgeons and officers with extensive experience that in all theatres of operation air evacuation should be used whenever it is available and practical. It is also agreed that efficient aero-medical transport services require careful preparation of trained special personnel, adequate special equipment and organized medical services in liaison with air and army operational and transport commands.

The advantages of air transport are many: improved efficiency of combat units by rapid removal of non-effectives; reduction in amount of medical supplies and personnel required in forward areas with consequent reduction in transport requirements during active operations

and conservation of medical supplies and personnel in protected areas; increased speed of evacuation of sick and wounded to bases where adequate medical care may be obtained—saving lives, decreasing suffering and convalescence, reducing number with permanent disability.

Other Studies

Many other significant studies are being made by the medical services of the Canadian Army—experiments on blood coagulation which may solve the problem of blood clots; studies on personal adjustments in the Canadian Women's Army Corps; civilian readjustment of soldiers discharged because of psychoneurosis; foot problems of soldiers; the use of drugs in relation to motion sickness; fumigants; individual water purifiers. These are but a few of many vital researches designed to improve the health of Canada's soldiers and thus to help strengthen the allied fighting power.

This article is one of a series on medical research by the armed forces. The others will appear in subsequent issues of CANADA AT WAR.

Facts and Figures

ARMED FORCES STRENGTH

(more than)

	Pre-war	Present
Navy	1,700	80,000 (75,500 men, 4,500 women)
Army	4,500	478,000 (465,000 men, 13,000 women)
Air Force	4,000	203,000 (189,000 men, 14,000 women)
Total	10,200	761,000 (729,500 men, 31,500 women)



MERCHANT NAVY

Canadian merchant seamen's identity certificates issued..... 31,835

Total personnel of ships of Canadian registry and Canadian seamen serving on other ships, missing or lost at sea as a result of enemy action:

On Canadian vessels.....	628	
On other vessels.....	341	
		969

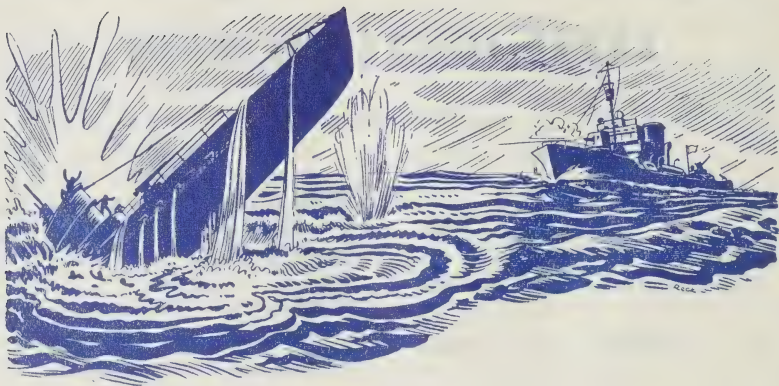
Canadian merchant seamen prisoners of war:

Personnel of ships of Canadian registry detained by the enemy.....	129	
Canadian seamen detained by the enemy while serving in ships of other than Canadian registry.....	55	
		184

Died in captivity.....	1	
Repatriated to United Kingdom and Canada.....	39	
		40
TOTAL STILL DETAINED,		144

In European theatre of war.....	128
In other theatres of war.....	16

NAVY



CANADA'S fighting navy has progressed a long way since the days when German U-boats were sinking allied merchant shipping on the north Atlantic convoy route at an average rate of 1,000,000 tons each month.

In those days U-boats actually outnumbered vessels escorting United Nations convoys. They were able to prowl in packs of eight or more, virtually unmolested, among lightly protected merchant shipping and to harry allied cargo ships night after night. So weak was convoy escort protection in the early stages of the Battle of the Atlantic that outnumbered Canadian-built corvettes crossed the Atlan-

tic armed literally with nothing but a single wooden gun.

Now the tables have turned. On the north Atlantic the Canadian protective escort vessels far outnumber attacking submarines. Indicative of this steady shift in strength to allied favor was the recent sinking of a single German U-boat in the Atlantic, an action in which no less than one British and five Canadian warships took active part. Canadian ships involved were the corvettes *Chilliwack* and *Fennel*, the frigate *St. Catharines* and the destroyers *Chaudière* and *Gatineau*. The British vessel in the attack was the destroyer *Icarus*.

A further event in May served to emphasize to Canadians that, although the tide of battle has decisively turned against the U-boat, the submarine is still a potent menace to the Atlantic lifeline.

On May 15 it was announced that the frigate H.M.C.S. *Valleyfield* had been torpedoed and sunk while on convoy duty in the north Atlantic. Thirty-eight members of the crew survived, while 126 are dead or missing. The survivors were taken to an Atlantic port by the corvette H.M.S.C. *Giffard*.

The *Valleyfield* was the first Canadian frigate to be sunk and the first Canadian escort ship to be lost since the torpedoing of H.M.C.S. *Ste. Croix* in September, 1943. The *Valleyfield* had been commissioned in December, 1943.

Prominently mentioned by survivors of the *Valleyfield* was the efficiency of the new Canadian life jacket, the successor to the old style "Mae West" belts. The new jacket is the result of the combined research of Canadian and United States naval scientists and is said to be the finest in existence. It is fitted with a toque-like woollen cap on

which is mounted a small intermittently flashing light. A whistle is attached to the jacket to attract the attention of rescue boats. The jacket is designed to protect the neck, lungs, abdomen and groin against underwater explosion of depth charges. It also has a clip-hook with which the survivor may secure himself to a raft, drifting wreckage or even the jacket of another man. Experience has shown that many men have been lost solely because they have been too exhausted to cling to floating material long enough to be pulled out.

An indication of the growing importance of the part that the Canadian navy was scheduled to take in the invasion of Europe was revealed in important administrative changes in the organization of the Canadian navy overseas. The offices of senior Canadian flag officer (overseas) and senior Canadian naval officer (London) have been combined and will be known as the Canadian naval mission overseas. Headquarters will be in London. Vice-Admiral P. W. Nelles, senior Canadian flag officer (overseas), heads the mission, and Captain F. L. Houghton, formerly senior Canadian naval

officer (London), is deputy head.

While the principal role of the Canadian navy has been the protection of the north Atlantic convoy route, the progress of the war has taken Canadian warships and naval personnel much farther afield. When fighters and torpedo bombers of the Royal Navy's fleet air arm hammered the German battleship *Tirpitz* as it lay at anchor in Alten Fiord, Norway, ships and men of the Canadian navy had a share in the operation. Two of Canada's destroyers assisted in the protection of aircraft carriers on which planes attacking the *Tirpitz* were based, while four Canadian naval fliers, members of the R.C.N.V.R. on loan to the Royal Navy, were pilots in fighter squadrons which attacked the battleship in the van of the bombers. One Canadian naval flier who led one of the fighter squadrons was awarded the Distinguished Service Cross for his part in the daring action. At least three other Canadians served as officers on Royal Navy ships which took part in the operation.

The protection of allied convoy routes and the carrying of invasion forces to enemy shores

have taken ships of the R.C.N. far from home waters. Seven Canadian corvettes and a flotilla of motor launches saw duty in the Caribbean area; Canadian ships took part in the campaign for the Aleutian Islands; four Canadian landing craft flotillas were in the Sicilian and Italian invasions; Canadian Tribal destroyers have seen duty with convoys to North Russia and were with the convoys attacked off Bear Island at the time of the sinking of the German pocket battleship *Scharnhorst*.

The strength of personnel has increased from about 1,800 at the beginning of the war to a present strength of more than 80,000—a 45-fold increase. In 1943 alone, 27,000 persons were added. About 40% of the men in the R.C.N. are serving at sea; a large number of those on shore have had sea service. Others ashore are undergoing training or are carrying on administrative, instructional or professional duties.

In ships there has been a 54-fold increase—from six combat ships to 250, from seven auxiliary vessels to 450.

Canadian naval personnel are now manning two aircraft car-

riers of the Royal Navy; flying personnel are supplied by the Royal Navy's fleet air arm. The ships are under the operational direction of the British Admiralty.

In preparation for the invasion of western Europe, Canadian Navy landing craft flotillas

trained day and night around United Kingdom coasts and Canadian Navy officers and ratings took the Royal Navy's intensive navy commando course.

Operations of the Women's Royal Canadian Naval Service are described under "Women," page 49.



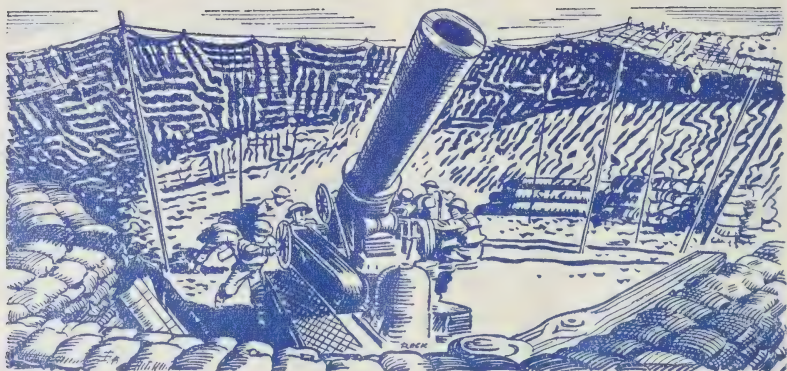
VICTORY GARDENS

Wartime gardens in Canada produced approximately 115,000,000 pounds of vegetables in 1943 in urban centres with a population of 1,000 or more. The estimated total number of such gardens was 209,200, and the production per garden about 550 pounds.

It has also been estimated that one urban household in every seven had a wartime garden in 1943. There were about 15% more gardens in 1943 than in 1942 and 24% more than in 1940.

Of the total volume of vegetables produced, about 37% was potatoes; 14% tomatoes; 10% carrots; 6% beets; 4% cabbage; 4% beans, and 3% each of onions, cucumbers, rhubarb and turnips. Peas and sweet corn each represented 2%, and all other crops 1% or less of the total quantity produced.

ARMY



THE superbly trained and equipped army that represents Canada on the battlefronts today is the result of the war-time expansion of a small pre-war permanent force of 4,500 men.

The present army strength of more than 465,000 men compares with the maximum World War I strength of 389,639 reached in July, 1918. In addition, in this war there are more than 13,000 women in the Canadian Women's Army Corps.

In the army overseas are more than 245,000 personnel, including more than 800 members of the C.W.A.C. That army is made up of one army headquarters, army troops, two corps head-

quarters, corps troops, three infantry divisions, two armored divisions and two independent armored brigades.

The army in Canada includes units comprising a composite formation of three brigade groups on the west coast, each capable of operating independently; units engaged in coast defence and other operational duties, and overseas reinforcements undergoing advanced training in training centres and in a training brigade group in eastern Canada.

The first contingent of the First Canadian Division landed in the United Kingdom on December 17, 1939, three months

and seven days after Canada declared war. For nearly 4½ years since then the troops overseas have been reinforced and trained for an offensive against the Axis and to repel any possible invasion.

Before French resistance collapsed in 1940 Canadian troops actually had landed in France ready for battle, but they were recalled without going into action. After the evacuation of the British forces from Dunkirk in the first days of June, 1940, the Canadians were among the few adequately equipped troops left in the United Kingdom to meet an invasion.

In the months that followed, various Canadian detachments took part in raids on the European coast and, on September 9, 1941, on Spitzbergen, which was the largest raid of this nature.

Later that year, on the other side of the world, nearly 2,000 Canadian soldiers were engaged in the fighting at Hong Kong, and all were killed or taken prisoner when the fortress fell on December 25, 1941.

Canadian forces formed five-sixths of the United Nations troops in a raid on Dieppe on

August 19, 1942, and more than 3,350 Canadians were killed, wounded or taken prisoner. The Dieppe engagement was a reconnaissance in force, and use was made of the lessons learned there in the landings in North Africa.

As the fighting in North Africa developed, a group of Canadian officers and non-commissioned officers arrived there about the beginning of 1943 to gain battle experience with the British First Army in Tunisia.

Meanwhile organization of the troops overseas as a two-corps army, a development which had been forecast in April, 1942, was completed on January 16, 1943.

It was not until July 10, 1943, however, that these men, many of whom had been in the United Kingdom for more than 3½ years, engaged in any extended operation. On that date a British-Canadian-United States force landed in Sicily, and the Canadian First Division and First Armored Brigade were given a vital position in the line of battle. The Canadians served under General Sir Bernard L. Montgomery, then commander of the British Eighth Army.

In the 39-day conquest of Sicily there were more than 2,400

Canadian casualties, of whom approximately 1,800 were wounded.

On September 3, 1943, Italy was invaded. The First Division still formed the bulk of the Canadian part of the Eighth Army, but in November a further large contingent of Canadian troops arrived to engage in the heavy fighting. Subsequently Canadian units in Italy operated as a corps under Canadian command. To this corps was allotted two divisions, an armored formation and a proportion of army troops. First Division troops took part in the Adriatic fighting which ended in the capture of Ortona in December.

On May 24, 1944, it was disclosed that in the new 1944 offensive the corps in Italy was fighting at full strength for the first time and that Canadians had driven the crucial wedge through the Hitler Line. Thus they opened the Liri and Sacco Valley route to Rome for other units of the Eighth Army.

A unit of Canadians also has been fighting in Italy with the Fifth Army.

At the close of May the United Nations' preparations for an

invasion of Europe from the west were nearing completion. The Canadian forces in the United Kingdom were part of a group of armies under General Montgomery, now chief of British land armies for the western assault.

In the United Kingdom were army headquarters and a corps with appropriate quotas of army and corps troops. There were reinforcements, hospitals, the forestry corps, base installations, ordnance workshops and depots, the Canadian Women's Army Corps and administrative services. These all had their tasks and were training to fit into the plan of invasion operations.

The army headquarters and army troops were in a position to direct, administer and support the Canadian corps there, along with other formations of British or other allied troops which might be put in the same army organization.

Besides these major activities of the troops overseas, Canadian soldiers also have served in strategic defence areas in Newfoundland, Labrador, Iceland, Alaska, Gibraltar and islands adjacent to the West Indies and the United States east coast.

Meanwhile, during the war years, the army in Canada has concentrated on training reinforcements for the overseas army and on providing defence forces for Canada against the threat of possible attack on the North American continent.

A part of the army is composed of men who have been called up under the National Resources Mobilization Act for compulsory military training and service in Canada and its territorial waters and who by order-in-council may be despatched to areas outside Canada. Such troops formed a large proportion of the Canadian contingent which joined with United States forces in occupying the Aleutian island of Kiska, the last North American territory held by the Japanese, on August 15, 1943. These N.R.M.A. men are trained and fit for reinforcement purposes and can be sent to fight outside Canada if the necessary action be taken to send them.

No commitments have been made as to the nature or extent of Canada's participation in the war against Japan. However, the army recognizes fully that Canada is at war with Japan and is making plans accordingly. Canada as a Pacific power will

remain in the war until Japan is subjugated. Twenty Canadian officers are now on attachment to forces serving in the Pacific war zone. They will undergo a course in jungle warfare and later be assigned to fighting units to gain actual battle experience in the Pacific area. Ten officers are serving with United States forces, eight with Australian and two with New Zealand forces.

Following are army casualties in Canada and overseas to April 30, 1944:

Killed or died (i.e., killed in action, died of wounds, died of injuries, died while prisoner of war and all other fatal casualties except those presumed dead or deaths from natural causes.....	4,876
Presumed dead.....	184
Died of natural causes.....	1,073
TOTAL DEATHS.....	6,133
Currently missing.....	381
Currently prisoners of war or interned*.....	3,651
Wounded (not including wounded prisoners of war and those died of wounds)	8,225
TOTAL CASUALTIES*...	18,390

* The figure for prisoners of war does not include 55 who have been repatriated or have escaped.

The operations of the Canadian Women's Army Corps are described under "Women," page 50.

AIR FORCE

IN this crucial fifth year of war the Royal Canadian Air Force stands beside the other great allied air forces in the most tremendous aerial undertaking of all time—that of paving the way for allied land forces by softening up German resistance in Europe from the skies.

From a small pre-war nucleus of 4,000 men the R.C.A.F. has increased more than 50-fold until today it occupies fourth place in the air strength of the United Nations and fifth in the world. Through the giant machinery of the British Commonwealth Air Training Plan, Canada has been enabled to produce an air force which today, even after casualties and discharges, has a strength of more than 203,000. More than 100,000 air crew



members have been graduated.

The R.C.A.F. overseas now has a total strength of more than 50,000 officers and men. Its strength was almost doubled between January 1 and December 31, 1943. Of these 50,000 R.C.A.F. personnel 45% are air crew and 55% are ground crew. R.C.A.F. radio mechanics compose 45% of the strength of

the Royal Air Force radio mechanics establishment.

Canada is now and has been for many months the largest and principal producer of air crew for all British Commonwealth forces. R.C.A.F. graduates make up considerably more than half the total of all air crew trained by the British Commonwealth Air Training plan. Twenty-five

per cent of all air crew in European and Mediterranean areas under British tactical command are Canadian men, enlisted and trained in Canada. It is expected the proportion will increase to one-third of the total content of British-dominion-allied air crew strength under this command. Canadians on loan to R.A.F. squadrons have been represented in every operation of the R.A.F. originating in the United Kingdom and in a good many in other theatres of action.

Originally there were three Canadian squadrons which went overseas as units. Now there are at least 42 on actual operations. Nearly all their air crew are Canadian, commanding officers are Canadian, ground crew are Canadian, and the entire cost is borne by Canadians. About 20 of the squadrons are fighter, night fighter or intruder squadrons, and the rest are divided between the R.C.A.F. bomber group and coastal command.

The first R.C.A.F. unit sent overseas was an army co-operation squadron which reached England in February, 1940. A fighter squadron arrived the next June, and these fliers helped

turn the course of the war in the victorious Battle of Britain. When the Germans in North Africa were driving on Cairo and then when they were reeling back again, the R.C.A.F. fought side by side with the R.A.F. Later in Sicily and Italy they hammered the Axis forces. R.C.A.F. fliers also had a share in the successful Battle of Malta. They have participated as well in raids from Ceylon and on Japanese rail routes in Burma.

The R.C.A.F. issued its first communiqué of the war in 1942, long after it had assumed an active role in the conflict. On January 1, 1943, an R.C.A.F. bomber group was formed in the United Kingdom, and on February 8, 1943, the formation of an army co-operation wing of three squadrons was announced. Two of these squadrons had received their baptism of fire in the attack on Dieppe on August 19, 1942.

In Alaska and from bases in the Aleutian Islands Canadian fliers helped to drive the Japanese from their strongholds.

The role filled by the R.C.A.F. in the prelude to the invasion

drama was a large one. During 1943 R.C.A.F. bomber squadrons released 18,000 tons of bombs on Germany, Italy and occupied Europe and flew 20,000,000 operational miles.

In the first five months of 1944 the Canadian group alone sent 19,000 tons of destruction down on enemy territory. In May, 1944, it dropped 6,000 tons of explosives, incendiaries and mines on enemy targets. On 24 of the 31 nights in May the R.C.A.F. bomber group attacked Europe.

During this month of high pressure pre-invasion tempo, heavy R.C.A.F. bombers took part in dozens of attacks on German, Belgian and French military targets. On the night of May 27-28 the largest number of heavy bombers ever despatched from the group up to that time took part in operations in which bomber command sent out more than 1,000 aircraft. R.C.A.F. Halifax and Lancaster bombers were included in the force which made a 1,200-ton attack on the military depot at Bourg Leopold in Belgium. Every Canadian squadron was in action, and the bombing was well concentrated.

Almost every night Canadian Halifaxes carried out mining operations in enemy waters.

On the fighter front Canadian Spitfires were constantly in action and supported Marauders, Mitchells and Bostons of the Second Tactical Air Force and the United States Ninth Air Force which concentrated their attacks on railway yards in France and Belgium. Canadian fighters also flew many offensive sweeps and destroyed several enemy aircraft.

R.C.A.F. squadrons of the coastal command flew routine anti-shipping and anti-submarine patrols and shared in the damaging of a destroyer and two minesweepers off the west coast of France.

R.C.A.F. ground crew overseas introduced a new phase in the history of transportation by conveying a complete airfield from Scotland to southern England precisely on schedule and while remaining fully operational during the 500-mile journey. To accomplish this move required three convoys of camouflaged lorries, the largest of which was five miles long. Precise timing and co-operation among air

crews and the maintenance and administrative staffs of the Tactical Air Force unit was of the highest standard.

The trek was from the training grounds to a temporary operational base and was so ordered that the pilots of the squadrons served by the mobile airfield launched their first operational flights from the new base while the rearguard was still rolling.

Every member of the ground staffs, whether clerk or rigger, is able to participate in the defence of the airfield if necessary, having completed "tarmac commando" training before the move. Some of the drivers had arrived from Canada three weeks before the transfer and had to master convoy driving as well as their weapon training.

This movement is believed to be the largest non-stop advance by airfield crew and complete equipment in the present war.

Pacing the rapid wartime development of Canada's Northwest, the R.C.A.F. announced the formation of a new northwest air command effective June 1, 1944, with headquarters in Edmonton. Seventh in the coast-to-coast chain, the new command stretches from the

Alberta-Saskatchewan boundary to the coastal mountains of the west and to the Arctic waters of the north.

There have been four training commands functioning—Nos. 1, 2, 3, 4, with headquarters at Toronto, Winnipeg, Montreal and Vancouver respectively. Two defence or "home war operations" commands have been in operation—eastern air command directed from Halifax, and western air command at Vancouver. Previous to the formation of the new command the northwest was administered by western command, operated from No. 2 wing in Edmonton.

The expanding scope of Canadian participation in the northwest development has elevated its control far beyond "wing" status, especially in view of the international implications involved and by the extensive use of the northwest passage by the United States and by Soviet Russia.

Responsibilities of the new command will be manifold and broad, and will include the following: Control and operation of the existing Northwest Staging Route; control of airways traffic on that route; control of freight

and passenger priorities on all Canadian aircraft operating over the route; development, construction and maintenance of all R.C.A.F. works and buildings projects forming or to be formed as part of the route, and defence of the route itself.

A series of airdromes and aircraft control facilities have been constructed and put in operation in northwestern Canada, and the responsibility for the control, operation, maintenance and defence of the area is vested in the R.C.A.F. Certain formations, units and detachments had been formed to discharge these responsibilities, but the set-up proved insufficient for the magnitude of the undertakings.

To make the finest in surgical skill available to every wounded Canadian, the Canadian navy, army, air force and the Department of Pensions and National Health will set up joint treatment centres in the special fields of plastic surgery, neuro-surgery and orthopaedic surgery at Montreal, Toronto, Winnipeg and Vancouver. The armed services have co-operated in a medical way before, but this is the first time on such a broad scale.

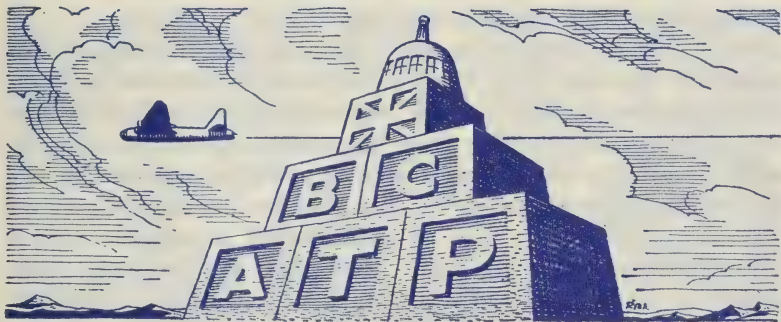
These joint centres may be opened in other cities across Canada, and the pooling of service specialists may spread to other branches of surgery. At present, however, the pooling arrangement applies to fields of surgery in which skilled men are in shortest supply. The pooling plan involves surgery frequently required for the same patient. A shell burst which shatters bones, soft tissue and nerves would require orthopaedic, plastic and neuro-surgery.

The plan is expected to give continuity of treatment for wounded from overseas to make certain that good work begun there is followed up by competent specialists. So far as possible overseas cases will be sent to centres nearest their homes.

In mid-May a Canadian-built Mosquito plane broke all former trans-Atlantic records. In crossing from Labrador to Northern Ireland, a distance of 2,200 miles, in six hours and 46 minutes it broke the previous record by two hours and ten minutes.

Operations of the R.C.A.F. (Women's Division) are described under "Women," page 51.

BRITISH COMMONWEALTH AIR TRAINING PLAN



CANADA has trained more than 100,000 air crew members under the British Commonwealth Air Training Plan. This training has been at the rate of about 3,500 every month since the plan was organized in 1940. In 1943, 39,000 air crew were produced, and 41,600 will be graduated in 1944, the year in which some of the schools will be closed.

The purpose of the training agreement signed by Canada, the United Kingdom, Australia and New Zealand was to man all aircraft which the Commonwealth produced and to supply as efficiently and speedily as possible a stream of well-trained air crew to obtain and maintain air

superiority over enemy sky fronts. The combined efforts of the British Commonwealth, the United States, and the Soviet Union are daily demonstrating that this purpose has been successfully accomplished.

Rapid expansion and adequate replacing power were allowed for. Planning for the production of human material is more difficult than planning for the production of shells or machines, and casualty rates must be taken into consideration. As the allies obtained air superiority earlier than had been anticipated, the German air force has become less of a menace from the point of view of casualties, and there have been fewer losses than were expected, particularly among pilots.

As this year is expected to be the most critical of the war, the United Kingdom and its allies are endeavouring to concentrate all their fighting power so far as possible in the front line. There is an immense training organization behind the fighting line which is being pushed forward for invasion softening up.

With the gradual slowing down of air crew training in Canada to enable the surplus of trained men to concentrate in the United Kingdom for the allied offensive, recruiting has been largely suspended in recent months. However, enlistment is now being resumed on a somewhat reduced scale. Reductions in the training plan will make it possible to release larger numbers of ground crew for remustering to air crew. In addition, the maximum age limit has been reduced from 33 to 28, and from 38 to 28 for gunners.

At present there are in the United Kingdom enough trained front-line air crew for the expansion of all the squadrons required by the British Commonwealth. Back of that are all the needed replacements, and, with those produced in 1944 and 1945, there will be an accumulated

backlog for even 1946. Production of trainees at or near peak capacity will continue until the end of 1944.

Canada is the contractor with the United Kingdom and the governments of the British Commonwealth to turn out air crew in an unlimited quantity so long as they are wanted. If they are not wanted because the need is more than filled, training at the same rate would be unnecessary and wasteful. The cost of training a pilot alone is about \$25,000.

Air force officers who have reached retirement age will be transferred to the R.C.A.F. reserve. Among those affected will be many who served in World War I and who were among the first to enlist in September, 1939. Their contribution during the time the R.C.A.F. and B.C.A.T.P. were expanding rapidly was of great value. Now, with plans for closing certain schools under way, a surplus of officers is imminent. As members of the R.C.A.F. reserve of officers, all will be available should their active services be required again. This retirement of senior officers will provide employment for younger officers who are gradually returning from overseas.

WOMEN



WOMEN IN THE ARMED FORCES

	Enlistments to June, 1944	
Women's Royal Canadian Naval Service	more than	5,000
Canadian Women's Army Corps.....	" "	17,300
Royal Canadian Air Force (Women's Division)	" "	16,600
Nursing services		3,522
Women doctors in the armed services		41
Total	more than	42,463

Navy.—The Women's Royal Canadian Naval Service has grown since its inauguration in June, 1942, and its first training class of August, 1942, to a total enlistment of more than 5,000. With the doubling of quotas for the summer months, Wren recruits are reporting to H.M.C.S.

Conestoga at Galt, Ontario, for training in twice the numbers formerly accommodated there.

Canadian Wrens have been steadily arriving at overseas establishments in the United Kingdom and Newfoundland. The number serving at 45 Canadian ports and naval bases also

is continually growing. At Halifax alone there are more than 1,100.

Wrens in Canada have appeared officially in bell-bottom trousers on signal towers at east and west coast ports where as visual signallers they exchange messages with ships. These signallers, together with wireless telegraphers, teletypists and coders, take the same thorough training at the signal school at H.M.C.S. *St. Hyacinthe*, Quebec, as the men do. They take courses in coding, coding telegraphy and visual signalling in groups of 20, and in wireless telegraphy in 40's. The coding course lasts eight weeks. Instructors find Wrens especially adaptable in these new fields.

There are about 100 Wrens at *St. Hyacinthe* most of the time—occasionally more—and a permanent ship's company of 40 members of the W.R.C.N.S. who act as postal clerks, sick berth attendants, switchboard operators, writers, stenographers, pay writers, supply assistants, and teletype operators.

For the first time in naval history an admiral was piped on board a Wren ship in Canada and Wrens did the piping when the chief of naval staff recently

inspected H.M.C.S. *Conestoga*. He was officially greeted by a Wren guard of honor.

Army.—The Canadian Women's Army Corps, which was established in August, 1941, and commenced training on September 1, 1941, reached a total enlistment of more than 17,300 by June, 1944.

Latest project for C.W.A.C. personnel is a three-week course in practical domestic science being given at the advanced training centre at *Ste. Anne de Bellevue*, Quebec, for general duty personnel. Women on general duties are employed as batwomen, mess orderlies, kitchen helpers and in similar capacities, and were formerly trained as apprentices on each assignment of duty. Now, however, house-keeping for the army is being taught scientifically. The practical domestic science course teaches the routine subjects—care of household equipment, waiting on table, darning and mending, fire prevention and security. The women also learn voice culture in preparation for telephone duty in orderly rooms or on information desks and the operation of mimeograph machines in order to print company

orders. The graduates find the training valuable for their army jobs and know that it will serve as a foundation for the scientific care of their own homes when the war is won.

The driving and maintenance school at No. 3 C.W.A.C. basic training centre at Kitchener, Ontario, has been closed. In future such C.W.A.C. training will be given at the driving school at Woodstock, Ontario.

Air Force.—Oldest of Canadian women's active services, the Royal Canadian Air Force (Women's Division) was formed by an act of parliament July 2, 1941. Now, three years later, it has a total enlistment of more than 16,600.

At the formation of the division it was decided that the top-ranking officer would be a wing officer. Princess Alice, as honorary air commandant, alone wears the golden oak leaves of higher rank. Since then, promotions have been well earned until today there are three wing officers, 10 squadron officers, scores of flight officers, section officers, and assistant section officers.

To a considerable extent women have replaced men in

ground crew jobs in the R.C.A.F. As a result, many airmen have been able to remuster to air crew duty and today are taking part in the mass raids over Europe.

Senior officers, recently appointed to the rank of squadron officers, are stationed throughout Canada, at each of the commands of the service, as command staff officers. Supervision of the welfare, discipline, and efficiency of the airwomen within her command is the assigned task of each command officer. Cases of maladjustment to service life come to her attention. Periodically she visits all units within her command to see that Canada's airwomen are content in the service and are contributing their maximum to the R.C.A.F.'s effort.

Medical Services.—By June, 1944, there were 3,522 women in the nursing services of the armed forces. In the Royal Canadian Navy nursing service were 250, in the Royal Canadian Army Medical Corps, 2,895, and in the Royal Canadian Air Force, 377. There are 41 women doctors in the armed forces—five in the navy, 25 in the army, and 11 in the air force.

Industry.—Almost six times as many women are working in war industry as are serving in the uniformed forces. By October, 1943, there were 235,000 working in the factories and plants of the Dominion's war-time industries. Altogether 1,075,000 women were gainfully employed at this time in addition to more than 750,000 wives and daughters of farmers who supplemented the work of men to keep up the high level of food production.

By May, 1944, almost four years after its inception, the war emergency training program of the Department of Labour had enrolled a total of 49,297 women. There were 213 in training in full-time industrial classes and 21 in part-time classes. In plant schools 566 women were taking full-time classes, and 93 were in part-time classes. This made a total of 893 enrolled in 120 plant and industrial training centre schools by May.

Voluntary Services.—The war has shown that Canadian women have realized their duties of citizenship and are eager for opportunities to serve their community and help maintain public morale by voluntary war work.

This wealth of voluntary effort is channelled into many vital activities through the Women's Voluntary Services—a division of the Department of National War Services—which was set up in 1941 to co-ordinate voluntary organizations and to utilize as efficiently as possible the efforts of Canadian women.

Through the block system which W.V.S. instituted, urban centres are divided in small groups for the purpose of collecting information from and disseminating it to housewife volunteers.

Many types of work thus are carried on. In one city a house-to-house survey was made by this method in connection with a tuberculosis survey. Volunteers obtained "consent to examine" cards which bore the name of the occupant of each house. The local office checked all the cards, which were then sent to the tuberculosis survey office. As a result, 30,000 persons were X-rayed.

In another city the W.V.S. centre assisted Girl Guides in setting up a service for the care of children and has also helped to place discharged C.W.A.C. personnel. Other centres have organized and conducted blood donor, salvage and war stamps

drives. A nutrition campaign was greatly aided by volunteers making and sorting 10,000 mimeographed copies of the nutrition program which were later distributed through the block plan. A Montreal centre is opening a hostel for the use, in transit, of families of Canadian soldiers coming from the United Kingdom to live in Canada and for families of Royal Air Force personnel en route to permanent homes overseas.

A survey on what the average citizen hopes for in his post-war future was made in every tenth home in another district through the block system. University students were obtained for voluntary work in day nurseries and children's aid shelters; classes were given in hospital and first aid work to assist public health nursing; consumer education films were presented with volunteers training as projectionists.

Dozens of groups report many necessary routine, clerical and canvassing jobs.

Day Nurseries.—The day nursery scheme includes 61 government authorized projects—28 day nurseries for children below school age and 33 for school-age children. Previously this plan had provided that not more than 25% of the children cared for in any approved project would be accepted from mothers working in other than war industry. In April, 1944, an amendment in respect to Ontario, and in May, 1944, one in respect to Quebec, where most of the nurseries are functioning, stated that the Dominion minister of labour may agree to share expenses with the province where more than 25% of the children taken care of by any project are the children of mothers in non-war plants. Priority still is given to those of mothers in war plants.



During April more than 10,767,732 pounds of salvage were collected in Canada from voluntary salvage committees alone. Through other channels 197,618 tons of scrap iron and steel and thousands of tons of essential war materials were collected and disposed of.

MAY HIGHLIGHTS

- May 4. Major-General J. C. Murchie, 48, promoted to rank of acting lieutenant-general and appointed chief of Canadian general staff. Had been acting chief since Lieutenant-General Kenneth Stuart appointed chief of staff at Canadian military headquarters in London.
- J. S. Macdonald, chief of economic division of Department of External Affairs, appointed high commissioner to Newfoundland to succeed C. J. Burchell, previously appointed high commissioner to Union of South Africa.
- Herbert F. Gordon, assistant deputy minister of national defence for air, to be promoted to post of deputy minister to succeed S. L. de Carteret, retiring.
- May 5. Announced that United States government is halting its program of exploration for oil in Canada's northwest. Order-in-council outlining conditions covering future development of oil resources in Northwest Territories and Yukon tabled in House of Commons.
- May 6. Dr. Francisco del Rio y Canedo presents letters of credence as first ambassador from Mexico to Canada.
- May 10. Temporary reduction of butter ration by one-half pound during June announced.
- May 16. Increased allowances to discharged service personnel for educational or vocational training purposes effective June 1.
- May 17. Six types of new farm machinery removed from ration list.
- May 18. Foreign Exchange Control Board restrictions on travel between Canada and United States modified.
- May 19. Announced that Canada joined United Kingdom in request to protecting power, Switzerland, for full and immediate report on shooting of six Canadians and 41 other airmen in mass escape from German prison camp.
- May 22. Federal labour code extended to all Saskatchewan industries.
- May 23. Strawberries and raspberries placed under price ceiling for first time.
- May 26. Canadian legation in Chile and Chilean legation in Canada to become embassies. Diplomatic missions to be exchanged by Canada and Peru also to be embassies.

WARTIME INFORMATION BOARD PUBLICATIONS

IN addition to CANADA AT WAR, certain other reference material dealing with various aspects of Canada's war effort is available in limited quantities on request. It may be obtained by writing to the Wartime Information Board, Ottawa. Such material includes:

Reference Papers (issued irregularly)—Recent numbers deal with:

Canada's Role in the United Nations Relief and Rehabilitation Administration.

The Royal Canadian Navy.

Canada (its geography, population, history, constitution and war effort).

Canadian Prisoners of War.

Canadian Food and Agriculture in the War.

Facts and Figures Weekly—a summary of Canadian events regarded as significant.

Directory of Principal War Organizations—in which the purposes of each organization are summarized, and personnel and telephone numbers listed.

Post-War Planning Information (issued fortnightly)—a continuing survey of post-war planning in Canada.

Consumer Facts—a monthly bulletin of background information designed especially for teachers of home economics, writers, broadcasters and group teachers. It summarizes government orders affecting consumers.

Home Front Bulletin—a weekly bulletin containing current information of interest to women. It is designed for display purposes in schools, libraries, club-rooms, etc.

Canadian Affairs—a bi-monthly educational service for the armed forces in Canada and overseas, with a limited civilian distribution. Among home edition articles available are:

War-Changed Canada.

Future for Fighters.

The New North.

Canada as a Pacific Power.

Canada—World Trader.

Canada and the Post-War World.

People on the Land.

Canada's Constitution.

Price Controls for Victory.

Our Latin-American Neighbors.

A Film Policy for Canada.

Canadian Affairs Pictorial—a monthly pictorial sheet (24 by 36 inches) supplementary to CANADIAN AFFAIRS, with a limited civilian distribution. Pictorials available include:

Canadian Agriculture.

Canada—World Trader.

Controls for Victory.

Movies for the Millions.

The New North.

Graphic Sheet Series—in which various problems are dealt with for the benefit of industrial workers and trade union members; for use as enclosures, pay envelope stuffers, pin-up sheets, etc. Among issues available are those on:

Income Tax.

Unemployment Insurance.

Industrial Health.

Inflation.

A. J. Henry.

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